EDH 7916
CONTEMPORARY RESEARCH IN HIGHER EDUCATION

Instructor	Benjamin Skinner, PhD
Office	2-230F Norman Hall
Email	btskinner@coe.ufl.edu
Phone	352.273.4296
Class Meeting Time	Tuesday (5:10p - 8:10p)
Class Location	NRN 1-239
Office Hours	Tuesday (3p - 5p)

COURSE DESCRIPTION

Higher education researchers have a wide variety of quantitative tools at their disposal. Yet as the number and sophistication of these tools grows, so too do expectations about the quality of final analyses. Furthermore, increasing scrutiny of non-replicable results demands that researchers follow a proper workflow to mitigate errors. In this course, students will learn the fundamentals of a quantitative research workflow and apply these lessons using common open-source tools. We will cover project organization, data cleaning, and exploratory analyses as well as how to run basic econometric models and recover estimates for publication. Time and interest permitting, students will also cover some special coding and/or data gathering techniques. Throughout, students will use coding best-practices so that their workflow may be shared and easily reproduced.

COURSE OBJECTIVES

Students will learn:

1. To use a number of tools that are useful for conducting applied quantitative research, including:
    - R w/ RStudio
    - git w/ GitHub
    - R Markdown
2. To properly organize a project for maximum clarity and reproducibility
3. Best practices for cleaning/tidying/wrangling raw data into analysis-ready data

REQUIRED TOOLS, SOFTWARE, AND REGISTRATIONS

Students will be expected to bring a laptop to class. It does not matter whether the machine runs MacOS, Windows, or Linux; however, the student's machine needs to be relatively up to date and in good running order. It needs to be able to connect to the internet during class.

All software is freely available. Students need to download and install the following software on their machines:

- R : `cran.r-project.org`
- RStudio : `rstudio.com`
- git : `git-scm.com`

Students also need to sign up for a free GitHub account if they haven't already: `github.com/join`. Students should sign up using their University of Florida email address and request a Education discount at `education.github.com/benefits`.

TEXTS

Required

All necessary materials are online at `btskinner.io/edh7916` or can be downloaded from external sources. There are no required text books for the course.

Recommended

Students may find some of the following books / online resources helpful:

Chacon, S., & Straub, B. (2014). *Pro git*. Apress.

Healy, K. (2018). *Data visualization: A practical introduction*. Princeton University Press.

Wickham, H., & Grolemund, G. (2017). *R for data science*. O'Reilly Media.

ASSIGNMENTS

Class participation (25%): We will use class time to work through lesson modules together. Students are expected to follow along with the presentation and run code on their own machine. Students are also expected to answer questions and work through example problems throughout the class session.

Problem sets (50%): Every lesson module will end with a set of questions that students must answer. Students can work together to solve the problem sets, but everyone must submit their own work and do their best to give accurate attribution for borrowed/repurposed code. In general, problem set answers will need to be submitted via GitHub a week after they are assigned.

Reproducible report (25%): Students must produce a 3-5 page report on a higher education topic of interest. The report should be a combination of writing, tables, and figures, have minimal citations, and be fully reproducible with minimal effort. Students must use publicly available data.

GRADING

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Grades are assigned in accordance with current UF grading policies, which may be found here:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.asp

HONOR CODE

UF students are bound by The Honor Pledge which states,

> We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

The Honor Code (http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

ACCOMMODATIONS

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

COURSE EVALUATIONS

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

TENTATIVE SCHEDULE

Core topics

January 7

- Introduction to R
- Introduction to git

January 14

- Organizing a project directory
- Organizing a script

January 21

- Data wrangling I: Enter the Tidyverse

January 28

- Data wrangling II: A philosophy of data cleaning

February 4

- Data wrangling III: Merging and appending data

February 11

- Data wrangling IV: Working with strings and dates

February 18

- Functional programming I: `for`, `if/else`, `loops`

February 25

- Functional programming II: `purrr::map()`

March 10

- Exploratory data analysis: Data visualization with ggplot2

March 17

- Fitting regression models

March 24

- Outputting and saving production-ready tables and figures

March 31

- Creating dynamic research reports using RMarkdown + knitr

Additional topics

Based on time and student interest, we may cover one or more of these topics. Alternately, we may follow an emporium model, using class time to allow students to work independently or in small groups on the topic(s) of their choice.

- Working with databases and non-tabular data structures
- Using survey weights
- Web scraping and APIs
- Spatial mapping
- Bash scripting
- Advanced programming: parallel computing and Rcpp

April 7

- TBD

April 14

- TBD

April 21

- Student presentations